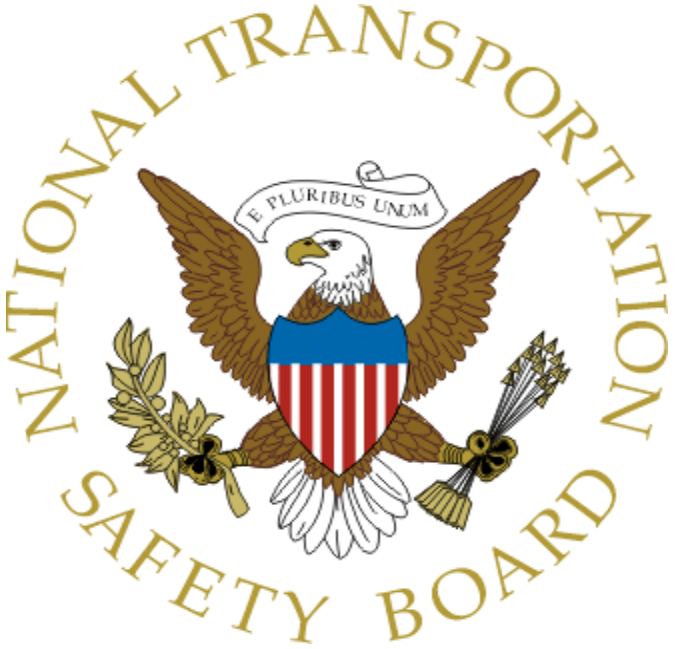
The Challenge of Prioritization



Christopher A. Hart
Vice Chairman

NTSB 101

- Independent federal agency, investigate transportation accidents, all modes
- Determine probable cause(s) and make recommendations to prevent recurrences
- *SINGLE FOCUS IS SAFETY*
- Primary product: Safety recommendations*

**Acceptance rate > 80%*

Two Scenarios

- High consequence events: Harm is typically
  - Widespread
  - Long lasting
  - Very costly
- High frequency events
  - Often longstanding
  - Stubbornly resist improvement efforts
  - Typically process problems, rather than people problems

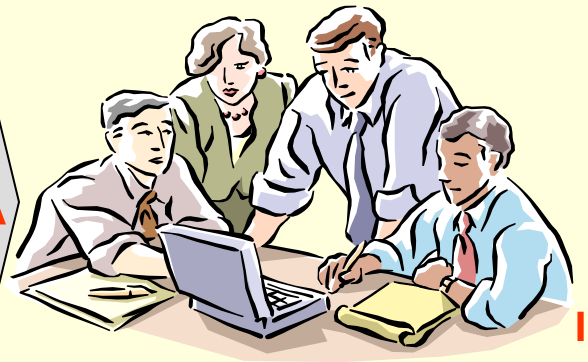
Preventing Mishaps

Tools and processes to convert large quantities of data into useful information

Data Sources

Info from front line staff and other sources

DATA



Analysts

Tools

Processes

USEFUL

INFORMATION

Smart Decisions

- **Identify issues**
- ***PRIORITIZE!!!***
- **Develop solutions**
- **Evaluate interventions**

Existing Prioritization Challenges

- A prioritization process can never be perfect because it is based largely upon predictions and judgment calls, especially in high-tech or otherwise continually changing operations
- A robust prioritization process may help predict the *worst* or *most frequent* adverse events, but not necessarily *every* adverse event*
- A prioritization process may face an uphill battle to the extent it directs resources toward the *worst* or *most frequent* adverse events, rather than toward the *most recent* adverse event
  - High consequence scenarios: Difficult to pursue long-term strategies due to being "whipsawed" by the most recent mishaps *("accident du jour")*
  - High frequency scenarios: Employees are frustrated because previous remedies proposed by management didn't address the worst mishaps, and this one probably won't, either

* *So when adverse events keep happening, how will you know the process is working?*

Examples

How many *other pressing issues* (if any) were being addressed when:

- NASA responded inadequately to previous events of separated foam that struck the orbiter during launch
- Concorde manufacturer and operators responded inadequately to previous tire disintegrations during takeoff
- Ford and Firestone responded inadequately to previous tire failures and rollovers in Ford Explorers
- The intelligence community responded inadequately to reports about people who wanted to learn to fly – but not how to land – in an airline flight simulator

Missing Element – The Harsh Glare of Hindsight

True, but Not Helpful

"Look at how much *LESS* it would have cost if you had addressed this hazard *BEFORE* it caused a mishap!"

and a variation on that theme . . .

"If you think managing this risk is expensive, wait until you see how much a mishap costs!"

Not Helpful Because . . .

You will probably identify *more potential concerns* than you have resources to address

Cost to address potential concern 1
\+ Cost to address potential concern 2
\+ Cost to address potential concern 3
\+ . . .
\+ . . .
\+ . . .
\+ Cost to address potential concern "n"

Total: Much more than available resources

So . . . how to decide what to fix first –
WITHOUT the benefit of 20-20 hindsight???

Factors to Consider

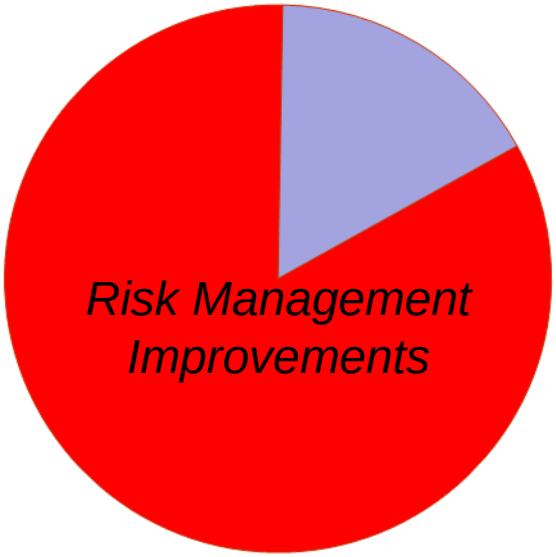
- Severity and likelihood – past, present, and future
- Cost of remedy
- Synergies of concern with other concerns?
- Synergies of remedy with other concerns/remedies?
- Other?
- Process question: First in, first out?

Future Prioritization Challenges

- IT advances enable collection and analysis of more data
- Industry is getting better at spotting pre-cursors before a mishap
- More potential problems to prioritize
- Risk management resources not likely to increase
- Difficulty of prioritizing potential mishaps that *have not yet occurred* over mishaps that *have already occurred*

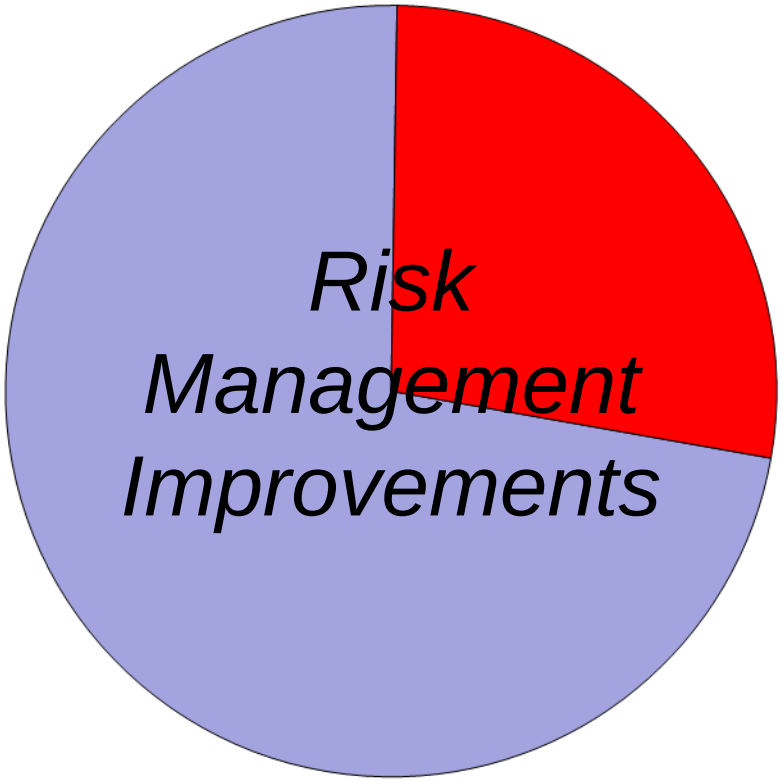
Source of Improvements

Past



(In aviation: "Fly, Fix, Fly")

Future



Legend – Improvement Ideas From:

- Mishaps that *have already occurred*
- Mishaps that *could occur*

Prioritization Process Should Be:

- Robust
- Objective
- Repeatable
- Sustainable
- Affordable
- Understandable

Issues

- What are the desirable characteristics of a good risk prioritization process?
- Should a risk prioritization process be based solely upon safety issues, or should it be more expansive and also consider economic, political, and other issues?
- To what extent is a risk prioritization process generic across different types of risks?
- How do we implement prioritization processes?
- Who should be responsible for implementation?
- How should implementation costs be allocated among implementing organizations?
- How do we measure the effectiveness of the prioritization process?

Next Chapter

- How to address prioritized issues
- Voluntary collaboration: *Everyone who is involved in the problem should be involved in developing the solution*
- Airline industry success story: CAST
  - Collaborative effort involving airlines, manufacturers, pilots, air traffic controllers, and the regulator
  - Reduced fatal accident rate by *65% in only 10 years*
  - Simultaneously improved productivity
  - Minimized unintended consequences
  - The process generated *no new regulations*

Thank You

For your valuable contribution

to this effort!